

REMARKS

By this response, Applicants have not amended the claims. As a result, claims 1-14 and 24-31 remain pending in this application. Reconsideration in view of the following remarks is respectfully requested.

In the Office Action, claims 1-3, 6-7, 9-13, 24, and 30-31 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,929,467 (Kawai). In response, Applicants respectfully submit that the Office misinterprets the teachings of Kawai. For example, with respect to claims 1 and 10, the Office alleges that Kawai's gate insulating film teaches Applicants' claimed step of "applying a dielectric layer... [that] includes silicon dioxide" when producing a nitride based heterostructure device. Applicants respectfully traverse this conclusion.

Interpreting Kawai only for the purposes of this response, an object of Kawai is "to provide a GaN-type FET which obtains a large input amplitude by using a chemically stable gate insulating film." Col. 2, lines 18-20. In order to achieve this, Kawai teaches a gate insulating film that "is composed of a Group-III nitride compound semiconductor containing at least aluminum as a Group-III element." Col. 2, lines 30-33. In a preferred embodiment, Kawai teaches a gate insulating film made from AlN that is laminated on a channel layer, which is made from n-type GaN, and a gate electrode disposed on the gate insulating film. See, e.g., col. 3, line 62- col. 4, line 35.

In support of its rejection, the Office cites col. 4, lines 44-56 of Kawai. However, the cited portion merely compares various characteristics of Kawai's device to those of an Si-MOS FET. In the Si-MOS-type of FET, "a gate electrode is formed on a Si layer with a silicon

[di]oxide (SiO_2) film therebetween.” Col. 1, line 66-col. 2, line 6. Kawai alleges that its gate insulating film (composed of a Group-III nitride compound semiconductor containing at least aluminum as a Group-III element as discussed above) “exhibits excellent insulation characteristics,” which makes Kawai’s FET “operable in a manner similar to a Si-MOS-type FET.” Abstract. In the cited portion of Kawai, the Schottky barrier formed between SiO_2 and a metal in the Si-MOS-type FET is compared with the Schottky barrier formed between AlN and Pt in Kawai’s GaN-type device. Col. 4, lines 44-56. As a result, contrary to the Office’s assertion, Kawai does not teach, *inter alia*, the use of a gate insulating film comprising SiO_2 in a nitride based heterostructure device.

In sharp contrast, Kawai merely compares operation of a GaN-type FET with an AlN gate insulating film to that of an Si-MOS FET with a SiO_2 gate insulating film. Applicants respectfully submit that the use of an SiO_2 gate insulating film on a Si-MOS FET does not teach or suggest its use on a nitride based heterostructure device. In particular, an Si-MOS FET comprises “a gate electrode [] formed on a Si layer” (col. 2, lines 1-2 of Kawai). Since the Si-MOS FET comprises an Si layer, SiO_2 is a known selection for use as a gate insulating film for an Si-MOS FET. However, the claimed method produces a nitride based heterostructure device by applying a first layer that includes nitrogen and a dielectric layer that includes silicon dioxide. The use of silicon dioxide as a dielectric layer for a nitride based heterostructure device is not taught or suggested by Kawai or the other cited art. As a result, Applicants respectfully request withdrawal of the rejection of claims 1 and 10 as allegedly being anticipated by Kawai.

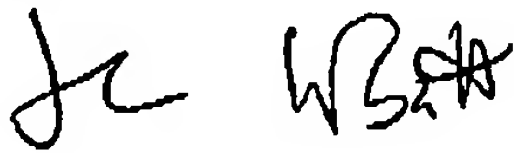
Further, with respect to the rejection of claims 2-3, 6-7, 9, 11-13, 24, and 30-31 as allegedly being anticipated by Kawai, Applicants note that the Office relies on its interpretation

of Kawai as allegedly teaching applying a silicon dioxide dielectric layer when producing a nitride based heterostructure device. To this extent, Applicants herein incorporate the various arguments presented above with respect to claims 1 and 10 from which these claims depend. Further, Applicants respectfully submit that these claims are patentable for one or more of their own unique features, for which Applicants reserve the right to present arguments should a subsequent response be necessary. As a result, Applicants respectfully request withdrawal of the rejection of claims 2-3, 6-7, 9, 11-13, 24, and 30-31 as allegedly being anticipated by Kawai.

Further, the Office rejects claims 4-5, 8, 14, and 25-29 as allegedly being unpatentable over Kawai in view of U.S. Patent No. 6,486,502 (Sheppard). Initially, Applicants note that the Office relies on its interpretation of Kawai as allegedly teaching applying a silicon dioxide dielectric layer when producing a nitride based heterostructure device. To this extent, Applicants herein incorporate the various arguments presented above with respect to claims 1 and 10. Further, Applicants respectfully submit that these claims are patentable for one or more of their own unique features, for which Applicants reserve the right to present arguments should a subsequent response be necessary. As a result, Applicants respectfully request withdrawal of the rejection of claims 4-5, 8, 14, and 25-29 as allegedly being unpatentable over Kawai in view of Sheppard.

In light of the above, Applicants respectfully submit that all claims are in condition for allowance. Should the Examiner require anything further to place the application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the number listed below.

Respectfully submitted,



John W. LaBatt, Reg. No. 48,301
Hoffman, Warnick & D'Alessandro LLC
Three E-Comm Square
Albany, NY 12207
(518) 449-0044 - Telephone
(518) 449-0047 - Facsimile

Dated: October 7, 2004

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.